

Scientific Alliance (The)

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THE
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1893

—OF—

NEW YORK.

COMPRISING THE MEMBERS OF

THE NEW YORK ACADEMY OF SCIENCES,
THE TORREY BOTANICAL CLUB,
THE NEW YORK MICROSCOPICAL SOCIETY,
THE LINNEAN SOCIETY OF NEW YORK,
THE NEW YORK MINERALOGICAL CLUB,
THE NEW YORK MATHEMATICAL SOCIETY, AND
THE NEW YORK SECTION OF THE
AMERICAN CHEMICAL SOCIETY.

PROCEEDINGS

OF THE

SECOND JOINT MEETING,

HELD AT

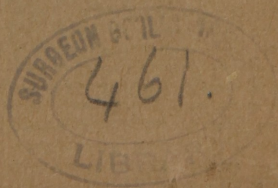
COLUMBIA COLLEGE,

Monday Evening, March 27th, 1893,

IN MEMORY OF

Professor JOHN STRONG NEWBERRY.

NEW YORK :
Press of L. S. FOSTER,
1893.



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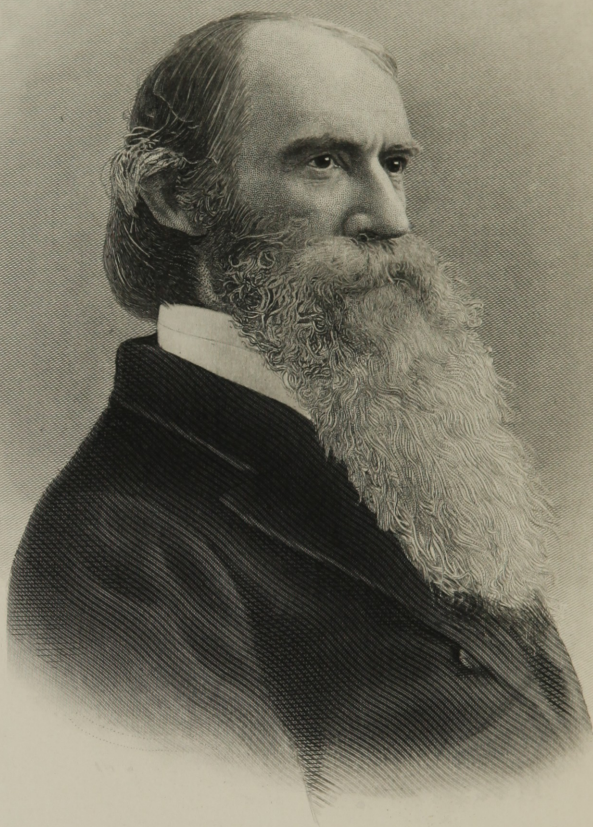
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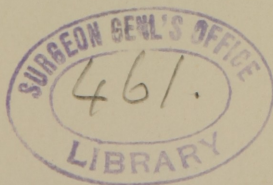
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COUNCIL OF THE SCIENTIFIC ALLIANCE OF NEW YORK

1892-1893.

From the New York Academy of Sciences.

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ELWYN WALLER.

Officers of the Council, 1892-1893.

PRESIDENT : CHAS. F. COX,

Grand Central Depot.

SECRETARY AND TREASURER : N. L. BRITTON,

Columbia College.

NOTE.

THE second Joint Meeting of the Societies forming the Scientific Alliance of New York, had for its object the honoring of the name and fame of the late Professor John Strong Newberry.

The Council of the Alliance has decided to establish a permanent memorial to Professor Newberry in the form of a fund, to be known as the JOHN STRONG NEWBERRY FUND FOR ORIGINAL SCIENTIFIC RESEARCH, for the terms and arrangement of which reference is made to page 38 of this pamphlet.

Reference is also made to the accompanying subscription blank and return envelope. It is earnestly hoped that all to whom this pamphlet comes will contribute something towards the fund.

A MEMOIR OF PROFESSOR JOHN STRONG NEWBERRY.

BY HERMAN LE ROY FAIRCHILD.

As the bright declining sun is suddenly eclipsed by clouds and so sinks slowly into night, so passed from earth our glorious friend. But in the memory and hearts of those who knew him he still lives, as a noble personality, impressive in appearance, charming in companionship, wise in counsel, himself greater than any work that he has done. To review his life will be both a profit and a delight. He was great enough to demand our reverence, good enough to claim our affection, and human enough to win our sympathy. It is the highest tribute that those who knew him best loved him the best.

Dr. Newberry was, taking him all in all, a truly great man. To a remarkably fine intellectual and moral endowment there had been added an unusually wide experience and a large degree of scholarly attainment. His abilities were such that he could have taken a high place in almost any profession. In his chosen field of natural science he was a master, and everywhere, whether in society, the university or scientific circles, he was a conspicuous figure, admired and honored.

By gifts of birth Dr. Newberry was a naturalist, and his inborn inclination toward geologic science triumphed despite the fact of his early selection of another profession. He was born before the days of scientific schools, and lacked the advantages of special instruction and scientific association. In his scientific work he was largely a self-trained observer and an independent worker, one of the few great "naturalists" by impulse. His range was not limited nor his independence checked by undue regard for authority of predecessors or teachers. His relation to schools of science was creative, not receptive.

HIS LIFE—CHRONOLOGY.

Dr. Newberry's life was not particularly eventful or romantic. Its history is the story of an active leader in his chosen field, who did the work, assumed the responsibilities, and enjoyed the honors that came to him.

Dr. Newberry was the youngest of nine children, seven daughters and two sons, none of whom are now living. He was born December 22, 1822, in the town of Windsor, Conn., where his eminent ancestors had lived since the settlement of the town by immigration from Dorchester, Mass., in 1635,

nearly two centuries. His grandfather, General Roger Newberry, was one of the Directors of the Connecticut Land Company that in 1795 purchased of the State of Connecticut the bulk of the tract in Northern Ohio known as the "Western Reserve of Connecticut." Henry Newberry, the father of John Strong Newberry, removed to the Western Reserve in 1824. He owned at first a square mile of land near the present centre of the city of Cleveland, but exchanged it for a tract at the falls of the Cuyahoga River, nine miles south, where at that time the water power was very valuable. He founded the town since known as Cuyahoga Falls, and engaged actively in the development of the coal resources of that region. Upon his property was mined the first coal known to have been offered for sale in Ohio.* Mr. Newberry built a fine house of a local red sandstone, erected mills, and was very successful in his enterprises.

Dr. Newberry's early life was passed amid fortunate conditions of competence and refinement, and the influence of his natural surroundings on the mind of the boy can be plainly traced. We can be sure that while he roamed the fields and woods with boyish love of sport he had the observant eye of the naturalist. The deep rock gorge of the river gave him a geologic section and an illustration of geologic agencies, while the coal mine on the estate supplied the plant fossils that awakened an interest in paleontology, which was to become a passion and the subject of much of his life-work. His perseverance is proof of his scientific bent, for by his own collecting and by exchange he accumulated a geologic cabinet which filled a large room in his father's house, and was the nucleus of what eventually became that extensive collection, now one of the glories of Columbia College. Before he entered college he had collected and studied mollusca and made an herbarium and a catalogue of the flora of the State, and had substantially mastered the zoölogy and botany of his county.

In 1846, at the age of twenty-four, young Newberry graduated from the Western Reserve College, at Hudson, Ohio, where, in the preparatory school, he had also made his preparation. During his college course and afterwards he was a close friend of his teacher in geology and natural science, Professor Samuel St. John. In college he was the same popular, kind and manly spirit that we knew in later life. A classmate writes of him: "Not a coarse word, not a cruel speech or act,

* For most of the facts relating to the ancestry of Dr. Newberry the writer is indebted to Mrs. Newberry, and to his oldest living son, Arthur St. John Newberry, of Cleveland. For facts relating to his boyhood and college days to Rev. N. S. Burton, Needham, Mass., Rev. E. Bushnell, Cleveland, Ohio, and Hon. M. C. Read, Hudson, Ohio.

not an ungentle thing of his doing occurs to the recollection of intimate acquaintance with him.”*

Another classmate writes: “He was a thoroughly manly man, a most congenial companion, a faithful student, not ambitious to excel, though ‘*facile princeps*’ in his favorite studies, and above the average in all; with a choice fund of wit and humor which he never used to give pain, but always pleasure; a self-poised and an ‘all-around man’ not often met with at his age. Though he had enjoyed advantages for social culture superior to most of his classmates, he showed no consciousness of superiority to any. His tastes were refined and pure, and I cannot conceive him capable of a mean or dishonorable action. I think he had a very just estimate of his own abilities. He certainly was not conceited, and was not self-distrustful.”†

After graduation he studied medicine as a post-graduate of the college and was assistant to Samuel St. John, the Professor in Chemistry in the Cleveland Medical School, from which he took his degree of M. D. in 1848. During the year following he practiced medicine at Cuyahoga Falls, and married Miss Sarah B. Gaylord, of Cleveland. In the autumn of 1849 he went to Europe for further medical study. Besides his attendance upon lectures and clinics in Paris he frequented L'Ecole des Mines and Le Jardin des Plantes, and heard the lectures of Adolphe Brongniart, the great paleobotanist of that day. Before returning to America he visited the south of France, Italy, and Switzerland.

In 1851 he resumed the practice of medicine in Cleveland, which he continued for about four years. During this time he kept up his interest in natural science and published ten papers, all in natural history except one, and the last four on fossil plants. His library and collections must even at this time have been well known, for during 1853 or 1854 they were used by Leo Lesquereux, who received from Dr. Newberry much help in the beginning of his labors on the plants of the Carboniferous.

Notwithstanding Dr. Newberry's flattering success as a physician his inclination toward scientific work was unquenchable, and it is evident from the following extract that his heart was not in his medical practice: “A conversation with him in his Cleveland office about two years after he opened it indicates his modesty and his high standard of attainment. He was asked by me whether he intended to make the practice of

* From an article by Rev. E. Bushnell, in *The Adelbert*, January, 1893.

† From a letter to the writer by Rev. N. S. Burton.

medicine the work of his life. His answer was, 'No, I am prosecuting my studies with the hope that some day I may be able to fill a place like Professor St. John's' ".*

In 1855 he left his practice and accepted the position of geologist and botanist on the Government expedition to northern California and Oregon, under Lieut. Williamson. The party left New York May 5, 1855, reached San Francisco May 30, and began field work, having reference to a route for the Pacific Railroad, near Benicia, July 10. Passing northward through the Sacramento Valley, and by the Klamath lakes, they reached the Columbia River October 9, but detached parties were in the field until the middle of November. The party returned to Washington, D. C., late in January, 1856. Dr. Newberry made large collections in geology, botany, and zoölogy, and spent the following year in Washington preparing his report, which is contained in the sixth volume of the Pacific Railroad Reports.

In 1856-7 he was Professor of Chemistry and Natural History in the Columbian College, Washington, D. C.†

Dr. Newberry had scarcely completed his report of the Williamson expedition before he became the physician and naturalist of the Colorado Exploring Expedition under Lieut. Jos. C. Ives. In charge of one detachment he left San Francisco October 28, 1857, by coast steamer for San Diego and crossed the desert to Fort Yuma, where he awaited the main body of the party, which sailed from San Francisco four days later, and after much delay, by adverse winds in the Gulf of California, reached the mouth of the Colorado November 29, and these putting together a small iron steamboat, carried in sections from Philadelphia, arrived at Fort Yuma January 9, 1858. During this delay Dr. Newberry had employed his time in exploring the surrounding region and in making valuable scientific collections. The expedition steamed up the Colorado River as far as the mouth of the Black Cañon, which was reached March 5, where an accident ended the steamboat voyage. The exploration of the Cañon was continued thirty miles farther, then the party returned to Mojave Valley, and March 24, the steamboat "*Explorer*" was sent back to Fort Yuma. The party with escort left the river, explored the Colorado Plateau some distance, then struck eastward past the San Francisco Mountains, reached Fort Defiance May 22, and returned east, via Santa Fé and Fort Leavenworth. Dr.

* Extract from a letter to the writer by Hon. M. C. Read, of Hudson, Ohio.

† In some publications it is incorrectly stated that he held this position until 1866. He held it only one year.

Newberry ever after took great interest in the Moquis tribes, with which he became acquainted upon this trip.

The report of the Ives Expedition was published in 1861. The geological report covers all the region which Dr. Newberry traversed from San Diego to Fort Leavenworth, and was the first detailed description of the lower Colorado region.*

The year following Dr. Newberry was again in the field as geologist of the San Juan Exploring Expedition, under Capt. J. N. Macomb. This expedition started from Santa Fé about the middle of July, 1859, passed up the valley of the Rio Chama, across the continental divide to the head waters of the San Juan, thence into southwestern Colorado and southeastern Utah to near the junction of the Grand and Green rivers, and returned by a circuitous route to Santa Fé in November. On account of the demoralization caused by the war the report on the geology and paleontology was not published until 1876. It is important to note that it was then printed exactly as written sixteen years earlier. That it should have been published so long after the work was done and subsequent to other work in the region is proof of its value, and of Dr. Newberry's confidence in the accuracy of his own earlier work.

The outbreak of the war of the rebellion found Dr. Newberry in Washington, in the service of the War Department, with which he had been connected for five years as Assistant Surgeon. In the supreme hour of his country's peril he forsook his scientific work and gave to the nation the benefit of his medical training. On the 14th of June, 1861, he became a member of the U. S. Sanitary Commission and immediately entered heartily into its work. On the first of September he resigned from the army and took the Secretaryship of the Western Department of the Sanitary Commission, having supervision of the work in the valley of the Mississippi, with headquarters first at Cleveland, but afterwards at Louisville. By correspondence and visitation he "began the work of turning into one great channel the thousand springs of philanthropy and patriotism that were bursting out in hamlet and city all over the land." Depots for the distribution of hospital supplies were rapidly established and plans made for the relief of sick and wounded. During all the years of the war Dr. Newberry was active in ameliorating the sufferings of both friend and foe, which, with his kindness of heart, was doubtless a much more grateful work than would have been that of

* In 1853 Jules Marcou had traversed the region on the 35th parallel as geologist of one of the Pacific Railroad exploring expeditions.

aggression and destruction. In overseeing the work of his organization, he at times followed the armies, and was present at the battle of Chattanooga.

The following extract from a letter by Hon. M. C. Read, one of his assistants in this work, would show that Dr. Newberry had organizing and executive ability and power of leadership. "All the agents for this work were selected by Dr. Newberry and assigned to their special duties. With an executive ability that is rarely equalled he seemed instinctively to put every man at the task he was best fitted for and to keep him up to his most efficient work. All reported to him at least every month, and oftener when emergencies demanded. All were treated with the utmost kindness and consideration, and all learned to love and honor him. No part of his life-work is entitled to higher honor."

His report upon the work of his department exhibits the character and magnitude of his labors. Over \$800,000 in money was expended in the benevolent work of the commission, and hospital stores were distributed to a value of \$5,000,000.

Dr. Newberry published only three scientific papers during the five years of his service on the Sanitary Commission, but added to his geologic collections, which had become very large. His scientific reputation was fully established and at the incorporation of the National Academy of Sciences in 1863 he was named by Congress as one of the fifty original members.

At the close of the war Dr. Newberry was employed at the Smithsonian Institution as collaborator and referee in matters relating to geology.

When the chair of Geology and Paleontology in the School of Mines, Columbia College, was established, Dr. Newberry was called to the place and honorably filled it from September 1866 to the time of his death, a period of twenty-six years. During the last two years, however, he was unable to perform its duties.

His extensive private collection in geology and paleontology was purchased by Columbia College, and was the beginning of the geological museum which under his affectionate care has become one of the best in America. It is especially rich in fossil fishes and fossil plants, the two groups of his particular interest, and in collections illustrating economic geology, necessitated by the character of the instruction.

Of the events during this last third of Dr. Newberry's life, rich in labor and fame, only brief notice can be given.

In 1867 he was President of the American Association for the Advancement of Science, at the Burlington meeting, and gave the presidential address. In the same year he received from his Alma Mater the degree of LL. D.

In February, 1868, Dr. Newberry became the President of the Lyceum of Natural History in the City of New York (after 1876 the New York Academy of Sciences) and remained the president of the society until the year of his death. His name was enrolled in most of the learned societies in America, and in many foreign societies.

When the Ohio State Geological Survey was established in 1869, Dr. Newberry, who had kept his home in Cleveland, was called by Governor Hayes to the directorship, and for several years the work absorbed most of the energy and time that could be spared from his college duties. The results will be spoken of later in this paper. An error was made in postponing the publication of the economic work and the appropriations were suspended in 1874. There was no formal termination of Dr. Newberry's survey, but from about 1878 he felt that his work there was over, and that there had been injustice and ingratitude, which wounded his sensitive spirit and perhaps somewhat embittered the later years of his life.

At the Centennial Exposition, 1876, Dr. Newberry was one of the judges, and prepared the report upon building and ornamental stones. From 1880 to 1890 he was President of the Torrey Botanical Club. In 1884 he was appointed one of the paleontologists of the U. S. Geological Survey, with particular reference to his favorite lines of study, fossil plants and fossil fishes.

One of his highest and most appreciated honors fell to him in 1888 in the award of the Murchison Medal, conferred by the Geological Society of London for distinguished services to geologic science. In 1889 he was First Vice-President of the Geological Society of America, which he had helped to institute in 1888. He was one of the Committee of the American Association for the Advancement of Science, which was instrumental in organizing the International Congress of Geologists, and perhaps his crowning and well-deserved honor as a geologist came in his election as President of the Congress for the Washington meeting, in August, 1891. But the tribute came too late for him to perform the duties of the office, or even to attend the meeting.

During the winter of 1889-90 Dr. Newberry was ill through exhaustion and a severe cold, from the effects of which he did not fully recover. The following summer vacation, which should have been wholly taken for recuperation, was used in close work upon the Amboy Clays flora. All his life his vacations had been periods of ardent scientific work, and he could not realize the necessity of rest. On the 3rd of December, 1890, he was stricken with paralysis. For only a brief

period in 1891 was he able to be in his rooms at the college for a few hours at a time. Restoration was sought in the South, in California, on the shore of Lake Superior, and at his home of later years in New Haven, Conn., but the rest had been too long deferred. On the night of December 7, 1892, at his residence in New Haven, the honored scientist, the beloved teacher, the noble man, went to his well-earned repose.

Dr. Newberry's oldest son died after beginning medical practice in Cleveland, but Mrs. Newberry with five sons and one daughter are now living to do honor to the memory of the revered husband and father.

SCIENTIFIC WORK.

Dr. Newberry was perhaps the broadest minded, the most cultured, the best equipped by natural gifts, education, and experience, of American geologists. Indeed, he was too broad, and deeply interested in too many branches of natural science to attain the very highest position in any one. He was too great a naturalist to be a specialist. His love of all sides of nature would not permit him to concentrate his work upon a single department.

That Dr. Newberry's work covered a very wide range a glance at the list of his publications will show. In many branches of geology and paleontology he was conspicuous, and his work was recognized in allied sciences. The titles in the list of his papers and books may be classified as follows :

Geology, general	73	
“ economic	38	
	<hr/>	111
Paleontology, vegetable	43	
“ animal	25	
	<hr/>	68
Botany	7	
Zoölogy	6	
Physiography	6	
Archæology	5	
Biography	3	
Miscellaneous	5	
	<hr/>	
Total	211	

IN GEOLOGY.—Two of the four earliest published articles by Dr. Newberry in 1851 were geological. But his first important publication in geology was in 1857, on the Geology of California and Oregon, in Vol. VI. of the Pacific Railroad

Reports. This, with his botanical and zoölogical reports in the same volume, are the result of his first serious professionally geological work, as geologist and botanist to the Williamson Expedition. This, first of his formal reports, exhibits well the good qualities of his work, namely, an appreciation of the more important phenomena, keen insight into their relations, a remarkable power of generalization, with lucid presentation. Our admiration for this work is increased when we consider that these reports were prepared and published, with elegant plates, in the year following the expedition. They justly made his instant reputation, and the trip was naturally but the introduction to his labors in the far West. His more elaborate geological report of the Ives Colorado Exploring Expedition was published in 1861, and that of the Macomb Expedition not until 1876, as already stated.

That Dr. Newberry was a pioneer in geologic exploration of the far West has not been sufficiently recognized by the younger generation of geologists and the public at large. His work was in advance of his time. The region was so unknown, the geological phenomena so stupendous, the problems so new, that even those capable of appreciating the results could not immediately use them. There was no popular interest, the field being unknown and inaccessible. But more than these was the fact that the interest of the whole nation was absorbed in the political questions of the hour, and the war of the rebellion prevented scientific work and exploration. Even Dr. Newberry yielded to the demand of the hour and gave himself to the service of his country. When the war was ended, Dr. Newberry's work was in the east. Other men went into the western fields, traversed the areas so well described by him, built upon his foundations, found an audience and public appreciation, and received a reward not less their due than Dr. Newberry never wholly received his.

As a professor in Columbia College, Dr. Newberry received a handsome salary and found much time to devote to his chosen work outside of his college duties. During this period of twenty-four active years he was incessantly working, and always with more upon his hands than he could properly dispose of. He accomplished, however, by his industry, a vast amount of the best work of his life. All but thirty-six of his 210 published papers were written after 1866.

Between 1869 and 1882 he published the several reports of the Ohio Geological Survey, consisting of three brief reports of progress and seven volumes of final reports, four of these in geology, two in paleontology, and one in zoölogy, and a geological atlas. He personally did a large part of the field work

and wrote the descriptions of a number of the counties. In the course of his work about Lake Erie he arrived at important conclusions concerning the preglacial drainage of the glaciated region and of the geological history of the Great Lakes, which later investigations have justified and which show his powers of insight and generalization.

Early in his work Dr. Newberry made practical application of his knowledge, his first paper in economic geology bearing date 1857. Thirty-eight of his titles fall into this class, most of them, however, after 1880. His opinion came to be highly valued and much sought after in relation to various kinds of mining properties, and frequent journeys were made in different directions, even in Mexico. Probably no other man has had, from personal observation, so full knowledge of the geology and resources of our national domain. The economic collections of the Columbia Museum were enlarged by these scientific trips to mining and quarrying districts. He also had a practical interest in the application of his science, and at one time was a large holder of petroleum lands, and had interests in Vermont marble quarries.

Dr. Newberry was one of the editors of Johnson's *Cyclopedia*, and wrote several of the papers in Appleton's *Cyclopedia*.

It is evident that Dr. Newberry's early experience in the western fields greatly influenced his mind and all his later work. To an intellect naturally comprehensive and sympathetic the years spent among the imposing natural features of the west added great breadth and power. The sweep of his experience, with his learning and mental grasp, enabled him to treat geological problems in a large way. He was never trivial or flippant or superficial. In his speaking and writing the loftiness of his theme was felt, for in describing so simple a thing as a fossil leaf, or shell, or fish-scale, he was reverent, as one dealing with the record of the earth's organic history. He made a scientific use of the imagination, and having in his mind, he reproduced to his audience, a picture of the geological conditions or phenomena he was describing.

IN PALEONTOLOGY—Dr. Newberry's most elaborate work, and on which his fame will more firmly rest, is that in paleontology. The study of coal-plants was one of his earliest pastimes, and during his medical course in Paris he improved his opportunities for enlarging his acquaintance with the science. If he had made a specialty of vegetable paleontology he could have become the foremost authority of his time. Forty-three titles of his papers belong to paleobotany, five of them dated as early as 1853. In 1884 he was made a paleontologist of the

United States Geological Survey, and published, in 1888, Monograph XIV. on the "Fossil Fishes and Fossil Plants of the Triassic Rocks of New Jersey and the Connecticut Valley." Two unpublished Monographs, "The Flora of the Amboy Clays" and "The Later Extinct Flora of North America," will appear as posthumous works under the editorship of his pupil and friend, Arthur Hollick.

Following is a critical estimate of Dr. Newberry's work in paleobotany by a present worker in that field :

"Dr. Newberry was a great geologist, without which qualification no one can appreciate the full significance of fossil plants. He never spoke of them without evincing a lively consciousness that they were once real and living plants, and that they belonged to the great record which time has made of the events which have transpired in the history of the earth. It was this constant realization of the objective truth which geology unfolds, a state of mind apparently wanting in the majority of geologists and paleontologists, that gave Dr. Newberry's utterances their chief weight, as well as their peculiar charm.

"Dr. Newberry was not a good botanist ; he had once been, but had neglected to keep pace with the science. Moreover, he seemed to have very little interest in the more important principles of botany. He was utterly indifferent to questions of classification, and to judge from his published papers one order of arrangement was as good for him as another. This was not from lack of knowledge, except so far as indifference checked the effort to know, and he was not wholly indifferent to the order of development of plant life, as his article on Fossil Botany in Johnson's *Cyclopedia* shows, although at the time that was written the true order had not yet been established as it is understood to-day, and his admissions of the apparent failure of plants to sustain the general law of development might have then been justified.

"Of Dr. Newberry's early pioneer work on the Carboniferous flora of America I do not profess to be a competent judge ; but I believe it was as good as could have been done at that time. His determinations of the later forms have not all stood the test of time ; but the same can be said of every worker in this field. He was no species-monger, and not prone to found species on insufficient material. His descriptions were all governed by strong common sense, and, unlike many other paleobotanists, he never forgot that he was dealing with real things. His discussions, therefore, of doubtful or unknown forms were always directed to ascertaining what they really were, and not merely to deciding what they should be called."*

* Extracted from a letter to the writer by Prof. Lester F. Ward.

Dr. Newberry's first published paper, 1851, had reference to fossil fishes, and twenty-four publications, distributed through the years, prove his continuous interest in ichthyic paleontology. In the later years of his life this branch seemed to have the greatest fascination for him, and he never wearied of talking about the remains of the remarkable Devonian fishes which he had described in the Ohio reports and deposited in the Columbia Museum. As early as 1856 he began publishing descriptions of the paleozoic fishes of Ohio, and in Vol. I., Pt. II., and in Vol. II., Pt. II., of the Ohio Survey Reports, he described the most remarkable of fossil fishes, the *Dinichthys*, which has probably attracted more attention from the scientific world than any other single description in his original work.

The reports upon the fossil fishes for the Illinois Geological Survey were made by Dr. Newberry and published in 1866 and 1870. In addition to Monograph XIV. of the United States Geological Survey, on the "Fossil Fishes and Plants of the New Jersey and Connecticut Trias," above referred to, he published an elaborate work in 1889, Monograph XVI. of the United States Geological Survey, on "The Paleozoic Fishes of North America."

Dr. Newberry kept himself informed as to the work done by others in ichthyic paleontology, and was very familiar with the older writers. His discoveries were numerous and important, and his detailed work was thorough and conscientious. He knew more about paleozoic and mesozoic fishes than any one else in this country. He gave little attention to the taxonomy of his subject, and was, perhaps, somewhat indifferent to classification, and did not attempt to seriously philosophize.*

IN BOTANY.—His best work in botany, exclusive of paleobotany, was done in the earlier years of his life, before it was crowded to one side by geology. Before he entered college he had, as stated above, gathered an herbarium and had made a Catalogue of the Plants of Ohio. This list was published in 1859, making forty-one pages of the Ohio Agricultural Report of that year. His earliest and best botanical publication was the report in 1857 on "The Botany of Northern California and Oregon" in the sixth volume of the Pacific Railroad Reports. His chapter in this elegantly illustrated report upon the forest trees of the region described is a classic in American forestry.

IN ZOÖLOGY.—Dr. Newberry was, as a boy, interested in the

* The writer is indebted to Professor E. D. Cope for the substance of this estimate of Dr. Newberry's work on fossil fishes.

mollusca, and one of his earliest papers, 1851, was upon this group. Only five papers of his can be strictly classed as zoölogical, apart from the paleozoölogy, the most important being upon the zoloögy of Northern California and Oregon. However, there is no great branch of animal life with which he was not very familiar.

RELATION TO NEW YORK SOCIETIES.

Rarely in this country has one man been longer at the head of a prominent scientific society continuously and without opposition. For twenty-four years Dr. Newberry honored the New York Academy of Sciences as its President. He was first elected in February, 1868, and remained continuously in office until February, 1892, when, on account of illness and absence, he was made Honorary President. During all this time there was no opposition to him, but, on the contrary, he was often re-elected in the face of his positive declination. He was seldom absent from the chair, and was a graceful and dignified presiding officer. In later years, perhaps, he did not use the power of his position and reputation for the benefit of the Society to the extent that a critical judgment, or the expectation of members might have demanded, but he was ever more than loyal, and gave the Society an added dignity and standing. And if he did not discover and develop the latent talent of the membership, or in the meetings draw out the modest members in discussion, he largely compensated by his own freely-given knowledge. It was rare that any subject was presented before the Society to which the President could not add something of genuine interest and value. Frequently his summing up of the discussion would give the very substance of the whole matter, and usually he would give, in his lucid way, the true bearings and the relationship of the presented matter to other subjects. In no circumstance did the range of his knowledge appear to better advantage than in the weekly Academy meetings.

It was very rarely that he presented a paper in writing, it being his habit to extemporize. This habit of extemporizing in public speech, and hesitating for the right word, gave to his utterance a drawling tone, which, to strangers, was very marked and unpleasant, but it was forgotten when they came to appreciate the man and his matter.

Dr. Newberry was chiefly responsible for the removal of the Academy's Library, first to the American Museum of Natura

History and then to Columbia College, and also for changing the meeting-place from the Mott Memorial Hall to the Academy of Medicine, and later to Columbia College.

The Torrey Botanical Club, for the decade 1880 to 1890, had Dr. Newberry as its President. He was a member of the Century Club, and of the New York Yacht Club.

HIS INFLUENCE.

With his attractive personality, rich experience, vast knowledge, and his social, generous nature, Dr. Newberry, more than any other geologist of America, was a "Nestor" to the younger generation of workers in geology. Many had worked under his direction; in later years many young men had been his students in the School of Mines, and a host of men had profited by his assistance or fatherly advice.

His high rank in the scientific world and his convenient location in the metropolis naturally brought to his rooms many visitors. No geologist on the continent had a wider acquaintance among scientific men, or was so affectionately regarded as a friend and counsellor by the younger geologists. For the youngest and the humblest he always had a cheery, cordial greeting. He was never too busy to drop his work for a caller, who was always made to feel that he was more than welcome. There was an unaffected cordiality and cheeriness in his manner which won instant confidence. No young man ever left his presence without encouragement and stimulus. His greatest influence, unseen but gracious and enduring, was in the personal contact with students and friends, and the impression of his marked individuality upon the younger men.

His amiability seriously interfered with his scientific and literary work, for his time was much broken by friendly visits. He would never turn away a caller to another time, no matter how urgent the task upon which he might be engaged. In his hours and work he was not systematic, and important correspondence or undertakings were neglected or left unfinished for lack of the time that a man less sociable, more severe and systematic, would have found.

Like many men of large experience and attainment he was inclined to monologue in conversation, but there was an entire absence of anything like boastfulness or self-laudation. He was the most modest of men, and it was exceedingly rare to hear from him anything about himself. He had a fund of anecdote, reminiscence and personalities about other people, which, related in his picturesque and pungent way, made others willing to listen.

His style of writing was somewhat ornate, perhaps better

described as picturesque, but very lucid and elegant. His short articles in Johnson's Cyclopedia may be taken as examples of his literary style, being models of clear scientific statement with enough of animation to vivify them. With his broad knowledge, his instinct of the true relations of facts, his capacity for generalization, his imagination, and his charming literary style, he might have become a great popular writer in natural history if he had sought such fame. But he wrote almost nothing of a popular character; an article on "The Geological History of New York Island and Harbor," in the *Popular Science Monthly*, October, 1878, is, perhaps, the only one of such a kind.

HIS CHARACTER AND DISPOSITION.

In temperament Dr. Newberry was cheerful and buoyant. He was fond of companionship, and there was an element of humor in his conversation, sometimes even a sort of dignified gaiety in his manner. But, like many persons of lively disposition coupled with a sensitive and delicate spirit, he had his periods of depression, and a trifling impatience of manner at times was not inconsistent with a very kind and affectionate nature. A slightly irascible temper of later years was probably due to his mode of life, and to some disappointments, and was really more in manner than in reality. A certain extravagant and picturesque way of speaking of other men might sometimes have caused misjudgment by a listener who did not know his real kindness of heart. Like most earnest workers and writers in descriptive natural science, he was jealous of priority and sensitive to criticism, but he never cherished any malice, and his disagreements with other men were not of a bitter and enduring nature. A personal interview would always disarm him. He was exceedingly affable and considerate of the feelings of others, in the truest sense a gentleman, and his really fine nature was best shown by the gentleness and considerateness with which he always treated those beneath him in position, and the very humblest in his employ. This sweetness of manner seems to have been a characteristic of the man from his youth.

Dr. Newberry was not a fighting scientist, nor a debater. His temper was too fine and sensitive to enjoy conflict with men. He keenly felt any injustice, but only in private was he likely to tell his feeling or speak his mind of opposition. He was not a politician, nor a schemer, and never sought to use men for his own purposes. He was pleased with praise and appreciated the honors which came to him in justly large measure. He had a proper amount of self-esteem, some personal

vanity and much true dignity, and was naturally sensitive, generous, and affectionate. He had a passion for music, and his violin was a sympathetic companion on his early expeditions. He also had an artistic sense, and many illustrations of scenery and fossils in his reports were drawn by himself.

Upon the exploring expeditions, from 1855 to 1860, Dr. Newberry was of necessity separated from his family. His labors on the Sanitary Commission, 1861 to 1865, also kept him away from his home, and subsequently for twenty years at Columbia College, with his family in Cleveland or abroad, he had rooms in the old college building, and lived an irregular and somewhat lonely life.

HIS FAME.

The ending of his life was inexpressibly sad. He was stricken down while vigorous in mind and with youthful feeling and ambition, and when many years might well have been anticipated for work and enjoyment—in the midst of work which he loved and upon which he felt that much fame rested. For two years he was compelled to be the helpless witness of his own impotence. We may not know the mental agony of those long months, when his body refused to obey his will and he was conscious of his departing intellectual powers. Some of us saw him during those months, and our love and admiration were increased as we beheld the proud, sensitive spirit trying to be cheerful and brave, and hopeful when there could be no hope. From the scientific and social circles he was suddenly removed, and the world was compelled to go on without him, while in his loneliness he awaited the inevitable.

What will be his fame as time goes on? Upon what will it mainly rest? In several lines of work he achieved distinction, even eminence. His most enduring fame will be that of a student and translator of the earth's organic history. Possibly in time his published work may be superseded by fuller and more thorough treatises. But if he did sacrifice the future reputation, that required specializing and limitation, it was for the sake of broader scholarship and greater personal influence. If he be less influential in the printed page of future science, he was the more powerful as a formative force in the day he lived. If he be less known of men in the coming years, it was to be better known of men while living, and to carry into the eternity a richer life and a broader intellect. Can we doubt which is the better fame? Dr. Newberry will live in a silent but a nobler way than merely by printed pages, in the universe of intellectual and moral forces, wherein must ever be the impress of his life. And his best renown is in the hearts of the many, who, as young men and beginners in scientific work, felt his

sympathy, caught some of his enthusiasm, and were by him stimulated and invigorated for life's work.

Professor JAMES F. KEMP presented the following letters :

No. I.

Letter from A. ST. J. NEWBERRY regarding Dr. NEWBERRY'S ancestry :

CLEVELAND, March 14, 1893.

Prof. H. L. Fairchild.

DEAR SIR—My mother has forwarded me your letter of the 8th inst., requesting that I should give you information, so far as I can, concerning Prof. John Strong Newberry's family history in America.

I take pleasure in submitting the following statement of facts :

Thomas Newberry, of Devonshire, England, settled in Dorchester, Massachusetts, about 1630. He died there about January, 1636, and his widow and children removed to Windsor, Connecticut, about the same year. His son, Capt. Benjamin Newberry, was the first named of seven (7) proprietors to whom Windsor was patented in 1685. He commanded the Military of the Colony. He left two (2) sons, Thomas, who was the ancestor of the Detroit and Chicago Newberrys, and Benjamin, who was our ancestor. Capt. and Major Benjamin, 2d, seems to have succeeded to his father's position as chief of the military forces of the Colony. His son, Capt. Roger, married Elizabeth Wolcott, daughter of Roger Wolcott, Governor of Connecticut. Capt. Roger graduated at Yale College in 1726, was a Deputy to the General Court for eleven (11) sessions. In 1740 he commanded a company from Connecticut in the expedition against the Spanish Main, and was present at the repulse of Admiral Vernon at Carthage in April, 1741. He died on the voyage home.

General Roger Newberry, son of Captain Roger, received his commission as Lieutenant of the Colonial forces in 1767. He was commissioned as Major in 1775, the commission being signed by Jonathan Trumbull, Governor, and George Willys, Secretary, of "His Majesty's Colony of Connecticut." In 1777 he received a commission as Colonel, signed also by Jonathan Trumbull, Governor, and George Willys, Secretary, "*of the State of Connecticut.*" In 1781 he was commissioned as Brigadier-General, and in 1783, after the peace, as Judge of Probate. He was one of the proprietors of the Connecticut Land Company, who purchased from the State of Connecticut the northern counties of Ohio, known as the "Western Reserve."

Henry Newberry, son of General Roger, went to Ohio in 1824 to look after his father's landed interest. He located his land at the falls of the Cuyahoga River, and founded the town since known as Cuyahoga Falls. Upon his property was mined the first coal known to have been offered for sale in Ohio.

My father, John Strong Newberry, was the younger of his two (2) sons. Mr. Henry R. Stiles, of Hill View, Lake George, Warren County, New York,

in his book, the "History of Ancient Windsor," gives a quite full account of the Newberry family. A new edition of this work is now in press.

I trust the foregoing will be what you need.

Yours truly,

A. ST. J. NEWBERRY.

No. II.

Letter from E. BUSHNELL, a college classmate, regarding DR. NEWBERRY'S college days.

CLEVELAND, O., March 15, 1893.

Prof. H. L. Fairchild.

MY DEAR SIR—I never heard Dr. Newberry speak much of his childhood and youth. The impressions made on my mind by what I did hear from himself and others, are something like the following :

He was born in Windsor, Conn., and his father was a man of means, who came to Cuyahoga Falls, Ohio, and owned some coal mines and stone quarries. The Doctor is recorded as having prepared for college at Hudson. He had been there before we entered college in 1842, in the Preparatory Department. As to his geological collection I am not geologist enough to describe it. His father's house was a large one, of sawed brown stone. In one wing was an office, containing surveying instruments and the like. Back of this was a room, perhaps 15x18 feet, and my recollection is that it was so full that it was difficult to get around in it. My recollection is that the collection consisted largely of slabs of slaty coal, on which were impressions of large fern leaves.

He was a good scholar. He was sometimes interrupted by the fact that he was only eight miles from home. But I should say he was in the highest third of his class. He was a good singer, and played some on the violin. He was a very genial companion.

His father's family was composed of parents and one brother and three sisters, as I remember them. They were cultivated and very delightful people. His mother remains, in my recollection, as a saintly lady, always to be revered.

Yours truly,

E. BUSHNELL,

Treasurer of Adelbert College.

No. III.

Letter from Professor J. H. VAN AMRINGE, of the School of Mines, regarding DR. NEWBERRY'S early connection with Columbia College :

NEW YORK, March 27, 1893.

Professor J. F. Kemp.

MY DEAR SIR—My acquaintance with Dr. John S. Newberry began in 1866, on his entrance upon his duties as Professor of Geology and Paleontology in the School of Mines.

The School had been opened just two years before. Prior to its establishment there was scarcely any such thing as the science of mining adapted to American conditions. This school was intended to supply it. It was further designed as a step in the direction of a School of Science as part of the University system to be developed at Columbia. During the first two years much had been done in arranging and conducting courses in mining and metallurgy, and in beginning the solid foundations on which the institution was to be based. The presence in the faculty of a trained geologist was felt to be a constantly growing necessity, and, most happily for the immediate need and future development of the school, Dr. Newberry was secured. His accession was hailed with delight. Possessed of great physical endurance and untiring industry, with an intense and infectious enthusiasm; with a mind original, singularly active, and well stored; with a judgment trained by wide experience in travel and observation, and in the management of men; accustomed to refined and exact scientific inquiry, he was a great acquisition to Columbia College, and could not but become, as he did, an important factor in its orderly expansion. He was always loyally devoted to the best interests of the school with which he connected himself. His influence was strongly felt in the enlargement and enrichment of its courses of study, in the formation and extension of its scope. His counsel was wise, and he had the confidence and the profound esteem of his colleagues. His pupils held him in most affectionate regard, and many of them he inspired with an enduring love of learning and research. In his large, unique, and admirably arranged collections, he was incomparable. His especial field as a teacher was in the higher regions of his science and with advanced students. He was rarely qualified by nature and accomplishment to be, as he was, a great university professor.

Very truly yours,

J. H. VAN AMRINGE.

No. IV.

Letter from Professor EDWARD ORTON, the present State Geologist of Ohio, especially with reference to Dr. NEWBERRY'S connection with the earlier Ohio Survey :

COLUMBUS, O., February 17, 1893.

MY DEAR PROFESSOR KEMP—I am glad to join with the members of the New York Academy of Sciences in paying a tribute of affection and respect to the memory of Dr. Newberry. I knew him well, and was closely associated with him for a number of years in a work which lay near his heart, viz., the Geological Survey of Ohio.

A geological survey of Ohio was begun under favorable auspices in 1837, but it was brought to an abrupt termination in 1839, mainly because of the financial condition of the State at that time.

From this date forward all the friends of the science in the State looked to a resumption of the work of the Survey, and many efforts to bring about such a result were made, which proved fruitless. It was left to Dr. New-

berry to draft a bill in 1869, which was passed by the Legislature, providing for a geological and natural history survey of the State. Governor Hayes appointed Dr. Newberry Chief of the Survey. In July of that year he entered upon the work. He brought to it the results of years of study in almost every section of the State, but particularly in the coal fields. He attacked the problems of correlation with enthusiasm and success. By the end of the season a good beginning had been made. The "Cliff Limestone" of the first survey had been resolved into its four components, and the Lower Helderberg limestone, which, up to this time, had never been identified in the State, was found to cover a far wider area than any other single element of the group. A geological map of the State was completed, and detailed examination of counties was in progress in all the districts into which the State was divided.

This was, perhaps, Dr. Newberry's happiest year in connection with the Ohio Survey. Before the end of 1870 a difference of view as to the prosecution of the work had developed within the organization of the Survey, and legislative inquiries followed such differences. In all these questions and controversies Dr. Newberry always carried his side when he was on the ground. If he had had only the work of the Survey on his hands he could have had his own way with it, but, as he sometimes reminded the Legislature, "the absent are always wrong."

In spite of such interruptions he followed out his original plans in their essential features. The two volumes of paleontology of the Survey were his special pride and remain as honorable monuments of his scientific acumen and his learning. His treatment of the Devonian fishes of Ohio constitutes the opening chapter of one of the most remarkable revelations of paleontology.

My relations to Dr. Newberry during these years were most cordial and intimate. He was prompt and generous in his recognition of the good work of any subordinate. His criticisms were kindly, but penetrating and helpful. I have never known a man whose conceptions were clearer and higher as to the value of the increase of knowledge, *per se*, irrespective of the obtrusion of personality into the questions involved. "The truths that we discover, the advances that we make," he would say, "are certain to remain, to become a part of the established knowledge of men, but the worker himself cannot long escape oblivion, at the best."

Dr. Newberry labored faithfully in his own field, and made splendid contributions to science. The *work*, we are sure, will remain as a permanent addition to knowledge; the memory of the *worker*, the genial friend, the inspiring companion, the broad-minded student of nature, we hereby pledge each other to keep fresh and green during the hours that remain of our own little day.

I am, my dear Professor, "

Faithfully yours, "

EDWARD ORTON

No. V.

Letter from SIR ARCHIBALD GEIKIE, Director General of the Geological Survey of Great Britain :

28 JERMYN STREET, LONDON, S. W. }
15th February, 1893. }

DEAR PROFESSOR KEMP—I am glad to learn from your letter of the 5th inst. that it is proposed to hold a meeting in memory of Dr. J. S. Newberry, and I most sincerely wish that I could be present at it to add my little tribute of respect, admiration, and affection. It has seldom been my lot to meet a man who at once so established himself in one's inner heart as a friend to be entirely trusted and loved ; one whose sympathy went out to you in a hundred ways, and who at the same time commanded your deepest respect for his brilliant intellectual gifts, and for that strong will and brave spirit that carried him through all difficulties and opposition. I never knew a man whose true character was more vividly expressed by his face, and I shall cherish, as long as I live, the memory of that noble head with its eye like an eagle's, its firm set mouth, and that play of kindly humor that used to light up the whole expression of his countenance.

Of his scientific career, of the wide range of his activity, and of the value of the contributions with which he enriched science, I have no room to say anything here. I trust that among his surviving friends some will be found anxious to give the world a clear outline of the enormous amount of work which he achieved.

I dwell rather on his personal character, and on the loss which his death has brought on all who knew him. For myself, one of the strongest links which bound me to the States has now been severed, but amidst my sorrow I rejoice that it has been given to me to have the privilege of knowing and loving such a man. With truest sympathy in your efforts to do honor to his memory, I remain,

Yours ever truly,

ARCH. GEIKIE.

Mr. J. W. HOLLOWAY, of the Worthington Co. and President of the Engineers' Club, followed with personal reminiscences of Dr. NEWBERRY, drawn from the early days when they were boys together at Cuyahoga Falls. Remarks were also made by Prof. J. J. STEVENSON, Prof. R. P. WHITFIELD, Prof. J. K. REES, and Prof. D. S. MARTIN.

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EDITED BY J. F. KEMP.

The original list on which the following bibliography is based was prepared by Dr. NEWBERRY himself in 1889. It

contained, however, many gaps and omissions, which have been filled as well as possible. In this work much assistance has been rendered by Mr. ARTHUR HOLLICK, Dr. N. L. BRITTON, Professor L. F. WARD, and Professor H. L. FAIRCHILD, to whom grateful acknowledgments are due. Practically the same list as this is printed in chronological order in the *School of Mines Quarterly* for January, 1893, p. 99, and an extra leaf of additions, which are incorporated here, was distributed with the reprints. The *American Geologist* for 1893 will contain the complete, amended, chronological list. Dr. BRITTON also published in the Bulletin of the Torrey Botanical Club for March, 1893, pp. 95-98, a list of the botanical papers of Dr. Newberry, and on pp. 94-95 a list of the plants which have been named after him. In the following the papers are chronologically arranged under the headings: Archæology; Biography; Botany; Geology, Economic; Geology, General; Paleontology, Animal; Paleontology, Vegetable; Physiography; Zoölogy; Miscellaneous.

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Dr. NEWBERRY was also one of the editors of Johnson's Encyclopædia, having charge of Geology and Paleontology. He wrote many articles on these subjects for its pages in 1875 and the years immediately following.

Biographical sketches of Dr. NEWBERRY have been published in all the current biographical dictionaries and cyclopædias. Portraits of him appear accompanying such sketches in "Men of Progress," 1870-71, p. 317, and "Contemporary Biography of New York," Vol. V., 1887, p. 255. The Popular Science Monthly, Vol. IX., p. 491 (1876), contains a sketch with portrait, and in Fairchild's History of the New York Academy of Sciences, there is an excellent artotype. Since his death memorials have already appeared with portraits in the Engineering and Mining Journal, December 17, 1892, p. 581; the Scientific American, December 31, 1892, p. 423; the School of Mines Quarterly, January, 1893, p. 93, with two steel portraits, one taken in 1865 and one in 1887; the Bulletin of the Torrey Botanical Club, March, 1893, with an artotype; and the Bulletin of the Geological Society of America Proceedings of the Ottawa Meeting, December, 1892, also with an artotype. A memorial, by Prof. J. J. Stevenson, is to appear in the American Geologist for July, 1893, with a revised chronological bibliography by J. F. KEMP.

REPORT OF THE COMMITTEE RECOMMENDING
THE ESTABLISHMENT OF THE JOHN STRONG
NEWBERRY FUND FOR ORIGINAL SCIENTIFIC
RESEARCH.

To the Council of the Scientific Alliance of New York.

GENTLEMEN.—The Committee appointed by you to take into consideration the proposal made by Mr. George F. Kunz, that the joint meeting of the Societies, to be held on the 27th instant, should be made the occasion for the commencement of a movement looking to the establishment of a worthy and permanent memorial to the late Prof. John S. Newberry, begs to report,

That after discussion of several plans which have been proposed, your Committee recommends the establishment of a fund for the endowment of original research, to be known as the John Strong Newberry Fund, and to be administered under the direction of the Council of the Scientific Alliance of New York. In our opinion the aim of the Alliance should be to obtain for this purpose not less than \$25,000, the income from which should be devoted perpetually to encouragement and discovery in those departments of Science in which Dr. Newberry was himself an eminent worker, namely, Geology, Paleontology, Zoölogy, and Botany. We recommend that the subscription be received in any amounts, and that the invitations to subscribe be extended to all the friends of Science whom the Scientific Alliance can reach.

We believe that this form of memorial is the one which Dr. Newberry would have most thoroughly approved, not only in his own case, but also in that of any other man of Science for whom a similar office was to be performed; for, while it will result in a permanent testimonial to his great achievements, it will also continue to be, for all time, an incentive to others to imitate his illustrious example. While fittingly honoring Dr. Newberry's memory, it will at the same time be a substantial evidence of our high appreciation of the pursuit of pure knowledge, to which he was devoted, and will thus serve to promote one of the main objects for which the Scientific Alliance was formed.

We think it highly proper, in this particular case, that the Fund which is to be established as a tribute to Dr. Newberry should be applied in aid of those lines of scientific labor in which he was personally and actively interested, and we hope that this method of limiting and appropriating the Fund will serve as a precedent for the creation of other funds devoted to different branches of Science, as occasions may offer in the future. Thus it may come about that the Scientific Alliance will have under its direction in the years to come, endowment funds, not only for those branches of Science commonly known as Natural History, but also for those of Astronomy, Physics, Chemistry, and Mathematics.

In this way the usefulness of Dr. Newberry's life will be continued far into the future, and through his name the encouragement which he was ever ready to hold out to every co-worker in scientific fields will be extended to all the various branches of learning represented in the Scientific Alliance.

New York, March 25, 1893.

C. F. COX,	}	Committee.
N. L. BRITTON,		
GEORGE F. KUNZ,		

Accepted and approved by the Council,

N. L. BRITTON,
Secretary.

April 28, 1893.



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